Syllabus

FEDERAL POWER COMMISSION *v.* FLORIDA POWER & LIGHT CO.

CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT

No. 70–38. Argued November 15, 1971—Decided January 12, 1972

The Federal Power Commission (FPC) properly determined that the transfer of power from Florida Power & Light Co. (FP&L) to another Florida utility's "bus" (a transmission line into which subsidiary lines connect) and the simultaneous transfer of power from that utility's "bus" to a Georgia company gave the FPC jurisdiction over FP&L under § 201 (b) of the Federal Power Act, which grants jurisdiction to the FPC over "the transmission of electric energy in interstate commerce . . . and the sale of electric energy at wholesale in interstate commerce, but . . . not [over] any other sale of electric energy." The FPC's conclusion that FP&L energy was commingled with that of the other Florida utility, and thus was transmitted in interstate commerce, was substantially supported by expert opinion that is in accord with the known facts of electricity, and is sufficient to support its jurisdiction. Pp. 454–469.

430 F. 2d 1377, reversed and remanded.

WHITE, J., delivered the opinion of the Court, in which BRENNAN, MARSHALL, and BLACKMUN, JJ., joined. DOUGLAS, J., filed a dissenting opinion, in which BURGER, C. J., joined, *post*, p. 469. STEWART, POWELL, and REHNQUIST, JJ., took no part in the consideration or decision of the case.

Samuel Huntington argued the cause for petitioner. With him on the brief were *Solicitor General Griswold*, *Gordon Gooch*, and *Drexel D. Journey*.

Jefferson D. Giller argued the cause for respondent. With him on the brief were *Leon Jaworski*, *Jay W. Elston*, *Harry A. Poth, Jr.*, and *Richard M. Merriman*.

Briefs of *amici curiae* urging reversal were filed by *George Spiegel* and *Melvin Richter* for the Gainesville Utilities Department et al., and by *Northcutt Ely* for the American Public Power Assn.

MR. JUSTICE WHITE delivered the opinion of the Court.

We are asked to determine whether the Federal Power Commission exceeded its statutory authorization when it asserted jurisdiction over the Florida Power & Light Co. Section 201 (b) of the Federal Power Act, as amended, 49 Stat. 847, 16 U. S. C. § 824 (b), grants the Federal Power Commission jurisdiction over "the transmission of electric energy in interstate commerce and . . . the sale of electric energy at wholesale in interstate commerce, but . . . not [over] any other sale of electric energy . . . ." Section 201 (c) defines energy transmitted in interstate commerce as energy "transmitted from a State and consumed at any point outside thereof." [1] In *Connecticut Light & Power Co.* v.

[1] The relevant sections of 16 U. S. C. § 824, stated in full, are as follows:

"(a) It is declared that the business of transmitting and selling electric energy for ultimate distribution to the public is affected with a public interest, and that Federal regulation of matters relating to generation to the extent provided in this subchapter and subchapter III of this chapter and of that part of such business which consists of the transmission of electric energy in interstate commerce and the sale of such energy at wholesale in interstate commerce is necessary in the public interest, such Federal regulation, however, to extend only to those matters which are not subject to regulation by the States.

"(b) The provisions of this subchapter shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce, but shall not apply to any other sale of electric energy or deprive a State or State commission of its lawful authority now exercised over the exportation of hydroelectric energy which is transmitted across a State line. The Commission shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction, except as specifically provided in this subchapter and subchapter III of this chapter, over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or

FPC, 324 U. S. 515 (1945), we noted that by this definition the initial jurisdictional determination "was to follow the flow of electric energy, an engineering and scientific, rather than a legalistic or governmental, test." *Id.*, at 529; *FPC* v. *Southern California Edison Co.*, 376 U. S. 205, 209 n. 5 (1964).

In the case now before us the FPC hearing examiner and the Commission itself, utilizing two scientific tests, determined that the Florida Power & Light Co. (FP&L) generates energy which is transmitted in interstate commerce. They therefore held the company subject to the Commission's jurisdiction. Respondent FP&L argues that an alternative model better represents the flow of its electricity; by use of this model it purports to demonstrate that its power has not flowed in interstate commerce. The Court of Appeals for the Fifth Circuit rejected the FPC's tests as "not sufficient to prove the actual transmission of energy interstate." *Florida Power & Light Co.* v. *FPC*, 430 F. 2d 1377, 1383 (1970). It did not approve FP&L's test ("Both [the FPC and the FP&L tests] suffer from the same vice," *id.*, at 1385), but because the FPC must shoulder the burden of proof, its finding of jurisdiction was set aside.

We granted certiorari to determine if either of the FPC's tests provides an acceptable basis at law and a sufficient basis in fact for the establishment of jurisdiction. 401 U. S. 907 (1971).

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over facilities for the transmission of electric energy consumed wholly by the transmitter.

"(c) For the purpose of this subchapter, electric energy shall be held to be transmitted in interstate commerce if transmitted from a State and consumed at any point outside thereof; but only insofar as such transmission takes place within the United States.

"(d) The term 'sale of electric energy at wholesale' when used in this subchapter, means a sale of electric energy to any person for resale."

I

FP&L is Florida's largest electric utility. At the time relevant to this litigation it served nearly one million customers, ranked ninth nationally among electric companies in revenues, 14th in investment in gross utility electric plant, and 16th in kilowatt-hour sales. Despite this significant size, the peninsular nature of Florida, the concentration of the company's sales in the southern part of the State,[2] and the recurrent threat of hurricanes which might sever power lines combine to make the operations of the company unusually insular and independent of the operations of like companies in other States. All of FP&L's equipment, including transmission lines, is confined to Florida and none of its lines directly connect with those of out-of-state companies.

FP&L does, however, indirectly connect with out-of-state companies. As a member of the Florida Pool, it is interconnected with the Florida Power Corp. (Corp),[3] the Tampa Electric Co., the Orlando Utilities Commission, and the City of Jacksonville. These interconnected utilities and authorities coordinate their activities and exchange power as circumstances require.[4] In 1964 FP&L transferred over 107 million kwh to Corp

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[2] Seventy-five percent of FP&L's load is concentrated at the southern tip of Florida, some 400 miles south of the Georgia border. Transcript of Proceedings before the FPC 241. Reprinted in Joint Appendix submitted to this Court. Hereinafter referred to as (T).

[3] Corp was before this Court in *Gainesville Utilities Dept.* v. *Florida Power Corp.*, 402 U. S. 515 (1971), in which case its operations are described in some detail. Corp is a public utility subject to the FPC's jurisdiction.

[4] "The purpose of the energy interchanges is to take care of temporary needs. There are no economy sales (sales by a company that can produce lower cost power to a higher cost producer) because fuel costs are similar for all members [of the Florida Pool]." Opinion of the FPC Hearing Examiner, 37 F. P. C. 544, 562.

and received over 61 million kwh from Corp.[5] If power from FP&L flows in interstate commerce it is because Corp interconnects just short of Florida's northern border with Georgia Power Co.[6] and regularly exchanges power with it.[7] Georgia's lines transmit the power out of or into Florida. There are numerous instances in which transfers between Georgia and Corp are recorded as coinciding with transfers between Corp and FP&L.[8]

The Georgia-Corp interconnection serves another function. Corp, FP&L, and the other Florida Pool participants are members of the Interconnected Systems Group (ISG), a national interlocking of utilities which automatically provides power in case of emergencies. In time of emergency this power also would flow through Corp's links with Georgia. To date FP&L has had no occasion to call for ISG power. But when a midwestern utility sustained a 580-megawatt generating loss, a regularly scheduled 8-megawatt FP&L contribution to the Florida Pool coincided with an 8-megawatt contribution from the pool to the ISG system.

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[5] Hearing Exhibit No. 15, p. 1028 (T).

[6] It has other interconnections across state lines, but we concentrate, as did the FPC, on a single Georgia-Corp connection. If FP&L power is shown to flow through this connection the others need not be considered, because jurisdiction is established. See n. 7, *infra*.

[7] Opinion of the FPC Hearing Examiner, 37 F. P. C., at 564.

[8] FPC staff exhibits revealed 42 instances, discovered by meter readings at selected hours over a four-month period, in which a transfer from Georgia to Corp's bus was instantly followed by a transfer from that bus to FP&L. Hearing Exhibits Nos. 18, pp. 1048–1054 (T), and 19, pp. 1055–1059 (T). Five instances of power flow from FP&L to Corp's bus, followed by transmission from that bus to Georgia were recorded over the same period. Hearing Exhibit No. 32, p. 1116 (T). "For example, Staff's Exhibit No. 18, at page 6, graphically demonstrates that on September 28, 1964, at 7:00 o'clock p. m., there was a flow of 51,000 kw of interstate power from Georgia to Corp and an instantaneous flow of 50,000 kw of . . . power from Corp to FPL." Opinion of the FPC, 37 F. P. C., at 550.

These relationships establish the focal issue in this case. The FPC may exercise jurisdiction only if there is substantial evidentiary support for the Commission's conclusion that FP&L power has reached Georgia via Corp or that Georgia's power has reached FP&L because of exchanges with Corp. What happens when FP&L gives power to Corp and Corp gives power to Georgia (or vice versa)? Is FP&L power commingled with Corp's own supply, and thus passed on with that supply, as the Commission contends? Or is it diverted to handle Corp's independent power needs, displacing a like amount of Corp power which is then passed on, as respondent argues? Or, as the Commission also contends, do changes in FP&L's load or generation, or that of others in the interconnected system, stimulate a reaction up and down the line by a signal or a chain reaction which is, in essence, electricity moving in interstate commerce? Upon answer to these questions, jurisdiction rides.

If FP&L were directly involved in power exchanges with Georgia, there would be no serious question about the resolution of this case. Section 201 of the Federal Power Act owes its origin to the determination of this Court that a direct transfer of power from a utility in Rhode Island to a utility in Massachusetts is in interstate commerce. See *Public Utilities Comm'n* v. *Attleboro Steam & Electric Co.*, 273 U. S. 83 (1927). "Part II [of the Act] is a direct result of *Attleboro*." *United States* v. *Public Utilities Comm'n of California*, 345 U. S. 295, 311 (1953). There can be no doubt that § 201 achieves its end and fills the "Attleboro gap" by giving the FPC jurisdiction over direct exchanges. *Connecticut Light & Power Co.* v. *FPC*, 324 U. S. 515 (1945).

Nor would there be any difficulty in resolving this case if the company or companies that stood between FP&L and the out-of-state power companies could be shown to be sometimes no more than a funnel. In

Jersey Central Power & Light Co. v. *FPC*, 319 U. S. 61 (1943), the first of the major FPC jurisdictional cases to be considered by this Court, Jersey Central supplied power to the Public Service Electric & Gas Co. (also a New Jersey company), which in turn had exchange arrangements with Staten Island Edison Corp. (a New York company). The transfer from PSE&G to Staten Island was effected through a "bus"—a transmission line of three conductors into which a number of subsidiary lines connect. The FPC showed through extensive sampling of the logs of the relevant companies, that on at least a dozen occasions when Staten Island drew power from the bus only Jersey Central was supplying the bus. Thus, the intermediate presence of PSE&G was shown to be, in some circumstances, a null factor, and it was established that Jersey Central energy was moving in interstate commerce.

In the litigation before us the record does not disclose situations in which Corp operated as a null or insufficient factor. Thus, the FPC has not in this litigation demonstrated with the clarity and certainty obtaining in the *Jersey Central* case that the energy flows that are a prerequisite to jurisdiction occurred.

This is not, however, the equivalent of saying that the flows did not occur or that there was not substantial evidence for concluding that they did. The Court of Appeals was hardly less emphatic than the Federal Power Commission in its conclusion that FP&L's "proof" that the flows did not occur was unconvincing. The court purported to have no opinion whether the flows had actually occurred. The question that must be resolved, therefore, is whether the evidence presented, though not so certain and convincing as that which the FPC offered in *Jersey Central*, was nonetheless adequate to establish jurisdiction.

We turn first to the conflicting contentions of the parties.

II

The Federal Power Commission followed alternate routes to its conclusion that FP&L energy moved in interstate commerce. The first course, based on what the Commission called the electromagnetic unity of response of interconnected electrical systems, is best represented in the words of the hearing examiner:

> "[N]one of the connected electric systems including that of Florida, Corp, and Georgia has any control over the actual transfers of power at each point of interconnection because of the free flow characteristics of electric networks. . . .
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> "An electric utility system such as Florida [Power & Light] is essentially an electro-mechanical system to which all operating generators on the interconnected network are interlocked electromagnetically. This means that electric generators, under ordinary operating conditions run either at exactly the same speed or at speeds which will result in a frequency of 60 cycles. No operating generator can change its speed by itself as long as it operates connected to the network. All generators connected to the same network must follow each other as to speed and frequency whenever there is a change in frequency, and the frequency of all interlocked generators is always exactly the same.
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> . . . . .
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> "If a housewife in Atlanta on the Georgia system turns on a light, every generator on Florida's system almost instantly is caused to produce some quantity of additional electric energy which serves to maintain the balance in the interconnected system between generation and load. If sensitive enough instruments were available and were to be placed throughout Florida's system the increase in generation by every generator on Florida [Power & Light] could be precisely measured."

The hearing examiner concluded:

> "The cause and effect relationship in electric energy occurring throughout every generator and point on the Georgia, Corp and Florida systems constitutes interstate transmission of electric energy by, to, and from Florida. It is the electromagnetic unity of response of Florida, Corp, Georgia and other interconnecting systems that constitutes the interstate transmission of electric energy by Florida." [9]

By this analysis a change in FP&L's load or generating pattern depletes or adds to the force available in out-of-state lines; therefore FP&L is transmitting energy in interstate commerce.

The alternative analysis by the Commission and its staff experts concentrates on power flow within the "Turner bus"—the point of connection between Corp's and FP&L's systems. Power supplied to the bus from a variety of sources is said to merge at a point and to be commingled just as molecules of water from different sources (rains, streams, etc.) would be commingled in a reservoir. On this basis the FPC need only show (1) FP&L power entering the bus and (2) power leaving the bus for out-of-state destinations at the same moment, in order to establish the fact that *some* FP&L power goes out of State.[10] The FPC purported to make this demonstration by a series of tracing studies.[11]

FP&L objects. The first approach is said to be tech-

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[9] Opinion of the Hearing Examiner, 37 F. P. C., at 567–568.

[10] If any FP&L power has reached Georgia, or FP&L makes use of any Georgia power, no matter how small the quantity, FPC jurisdiction will attach because it is settled that Congress has not "conditioned the jurisdiction of the Commission upon any particular volume or proportion of interstate energy involved, and we do not . . . supply such a jurisdictional limitation by construction." *Connecticut Light & Power Co.* v. *FPC*, 324 U. S. 515, 536. See also *Pennsylvania Water & Power Co.* v. *FPC*, 343 U. S. 414 (1952).

[11] See Exhibits Nos. 18 and 19, pp. 1048–1059 (T).

nologically sound, but legally insufficient in that it does not demonstrate that any FP&L power flows *in* interstate commerce, but only that it *affects* interstate commerce. Congress, it is argued, could have chosen to grant the FPC jurisdiction over activities affecting commerce, but it clearly did not do so.[12]

The second approach of the FPC purports to meet the standard at law, but according to FP&L it is technologically unsound. A bus is not a point, but rather a tangible, physical three-strand power line, in this case 225 feet in length. It is argued that it is not a general reservoir. Power, according to this argument, enters and is drawn off the line at discrete identifiable points. Power from any given source will not flow further along the line than loads of wattage cumulatively equal to the wattage of the power source. The distribution of entry lines and wattage loads on the Turner bus is said to demonstrate that all of the FP&L's power will be exhausted by Corp's load lines before the point, further down the line, where Georgia's load intervenes. When power flows in the opposite direction (*i. e.*, north to south) again the effect is one of displacement: Georgia's power goes to Corp's loads and the output of Corp's generators is thus displaced to FP&L.

III

We do not find it necessary to approve or disapprove the Federal Power Commission's analysis based on unity

[12] This argument is developed by the dissent in *Jersey Central Power & Light Co.* v. *FPC*, 319 U. S. 61, 78 *et seq.* Note particularly p. 88: "It is interesting to compare, in this connection, other statutes enacted by the same Congress [as the one which enacted Part II of the Federal Power Act]. Three adopted in July and August 1935 covered activities 'affecting' commerce; three, including the Federal Power Act in question, adopted in August 1935 did not cover activities 'affecting' commerce." Thus it was inferred that we are dealing with a particularly "discriminating use of language."

of electromagnetic response. Its alternative assertion that energy commingles in a bus is, in our opinion, sufficient to sustain jurisdiction.

In evaluating this second approach, the courts are called upon to do no more than assess the Commission's judgment of technical facts. If the Commission's conclusion of commingling is not overturned, then the legal consequences are clear.

The conclusion of the FPC that FP&L energy commingled with that of Corp and was transmitted in commerce rested on the testimony of expert witnesses. The major points expounded by these witnesses were probed, and in our opinion not undercut, by the hearing examiner's questions, FP&L's cross-examination, and rebuttal testimony of FP&L witnesses. The hearing examiner found the testimony persuasive and held that his conclusions could be independently reached upon it. A majority of the Commission, reasoning similarly, endorsed these conclusions.

A court must be reluctant to reverse results supported by such a weight of considered and carefully articulated expert opinion. Particularly when we consider a purely factual question within the area of competence of an administrative agency created by Congress, and when resolution of that question depends on "engineering and scientific" considerations, we recognize the relevant agency's technical expertise and experience, and defer to its analysis unless it is without substantial basis in fact. An appreciation of such different institutional capacities is reflected in the congressional directive defining the terms of judicial review of FPC action: "The finding of the Commission as to the facts, if supported by substantial evidence, shall be conclusive." Federal Power Act § 313 (b), 16 U. S. C. § 825*l* (b). See *Gainesville Utilities Dept.* v. *Florida Power Corp.*, 402 U. S. 515, 526–529 (1971).

The Court of Appeals appears to have rejected the Commission's conclusions for two reasons. First, it apparently regarded these conclusions as supported by mere speculation rather than evidence. In its view, expert opinion about the nature of reality, however logically compelling, is not fact.[13] Second, even if the Commission's views might be said to be supported by substantial evidence, the Court of Appeals apparently thought it important that the Commission acknowledged that its conclusions rest upon representations of a reality imperfectly understood. From this the Court of Appeals concluded that it was dealing with a "simplified characterization" which, despite the frequent use of that same characterization by other courts of appeals,[14] was too uncertain in its application to any particular situation to be used as the basis for establishing jurisdiction.

We reverse and reinstate the FPC's order because we do not think these points are well taken. As to the Court of Appeals' first reservation we hold that well-reasoned expert testimony—based on what is known and uncontradicted by empirical evidence—may in and of itself be "substantial evidence" when first-hand evidence on the question (in this case how electricity moves within

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[13] "Neither the examiner nor the Commission treated the commingling theory as a scientific fact depicting accurately what does occur but only as the more adequate way to conceptualize actual occurrences.

"The Commission expert witness Jacobsen acknowledged commingling has never been verified experimentally as fact." 430 F. 2d 1377, 1384–1385.

[14] See principally *Indiana & Michigan Electric Co.* v. *FPC*, 365 F. 2d 180 (CA7), cert. denied, 385 U. S. 972 (1966); *Arkansas Power & Light Co.* v. *FPC*, 368 F. 2d 376 (CA8 1966); *Public Service Co. of Indiana* v. *FPC*, 375 F. 2d 100 (CA7), cert. denied, 387 U. S. 931 (1967); *Cincinnati Gas & Electric Co.* v. *FPC*, 376 F. 2d 506 (CA6), cert. denied, 389 U. S. 842 (1967).

a bus) is unavailable.[15] This proposition has been so long accepted,[16] and indeed has been so often applied specifically to challenges to the FPC's determination of

[15] "Sometimes the reason for tolerating a gap either between evidence and findings or between findings and decision has to do with limitations of human intellects or limitations on the magnitude of investigations that may be conducted in particular circumstances. Not all propositions of fact that are useful and used in the administrative process are susceptible of proof with evidence. Or developing the evidence would be inordinately expensive." 2 K. Davis, Administrative Law Treatise § 16.11, p. 473 (1958).

[16] The weight of such testimony was properly recognized by Lord Mansfield some 190 years ago:

"The facts in this case are not disputed. In 1758 the bank was erected, and soon afterwards the harbour went to decay. The question is, to what has this decay *been owing? The defendant says*, to this bank. Why? Because it prevents the backwater. That is matter of opinion:—the whole case is a question of opinion, from facts agreed upon. Nobody can swear that it was the cause . . . . [T]he parties go down to trial . . . and Mr. Smeaton is called. A confusion now arises from a misapplication of terms. It is objected that Mr. Smeaton is going to speak, not as to facts, but as to opinion. That opinion, however, is deduced from facts which are not disputed—the situation of banks, the course of tides and of winds, and the shifting of sands. His opinion, deduced from all these facts, is, that, mathematically speaking, the bank may contribute to the mischief; but not sensibly. Mr. Smeaton understands the construction of harbours, the causes of their destruction, and how remedied. In matters of science no other witnesses can be called. . . . The question then depends on the evidence of those who understand such matters; and when such questions come before me, I always send for some of the brethren of the Trinity House. I cannot believe that where the question is, whether a defect arises from a natural or an artificial cause, the opinions of men of science are not to be received. . . . The cause of the decay of the harbour is . . . a matter of science . . . . Of this, such men as Mr. Smeaton alone can judge. Therefore we are of opinion that his judgment, formed on facts, was very proper evidence." *Folkes* v. *Chadd*, 3 Doug. 157, 158–160, 99 Eng. Rep. 589–590 (1782).

Modern analysis follows this perception. See 7 J. Wigmore, Evidence §§ 1917–1929, 1976 (3d ed. 1940 and Supp. 1970).

technical matters, that we do not consider it fairly in dispute. See, *e. g.*, *FPC* v. *Southern California Edison Co.*, 376 U. S. 205, 209 n. 5 (1964); *Travelers' Indemnity Co.* v. *Parkersburg Iron & Steel Co.*, 70 F. 2d 63, 64 (1934); *United States ex rel. Chapman* v. *FPC*, 191 F. 2d 796, 808 (1951), aff'd, 345 U. S. 153 (1953). As Judge Parker said in the Court of Appeals' opinion in the latter case:

> "The [substantial-evidence] rule is no different because the questions involve matters of scientific knowledge and the evidence consists largely of the opinion of experts. The court may not, for that reason, ignore the conclusions of the experts and the Commission and put itself in the absurd position of substituting its judgment for theirs on controverted matters of hydraulic engineering. It is in just such matters that the findings of the Commission, because of its experience and the assistance of its technical staff, should be accorded the greatest weight and the courts should be most hesitant to substitute their judgment for that of the Commission." 191 F. 2d, at 808.

On affirming, this Court noted,

> "[W]e cannot say, within the limited scope of review open to us, that the Commission's findings were not warranted. Judgment upon these conflicting engineering and economic issues is precisely that which the Commission exists to determine, so long as it cannot be said, as it cannot, that the judgment which it exercised had no basis in evidence and so was devoid of reason." 345 U. S., at 171.

The elusive nature of electrons renders experimental evidence which might draw the fine distinctions required by this case practically unobtainable. That does not

—mean that expert testimony is insubstantial and that FP&L is beyond federal regulation.

We think the second, related, concern expressed by the Court of Appeals exaggerates the standard of proof required in civil cases such as this. The lower court would apparently require tracing studies showing an energy flow-through like that demonstrated in *Jersey Central*.

We do not think *Jersey Central* sets such high jurisdictional standards. Special circumstances in that case (the occasional operation of PSE&G as a null factor) permitted the FPC to present clear and compelling proof of interstate transactions. But we assessed the FPC's determination not by the standards of certainty, but rather by the substantial-evidence test.[17] The fact that the FPC was exceptionally convincing in that leading case does not raise the standard that it must meet in all future cases.

Finding no reason in the case law for imposing a standard of certainty, we are not willing to construct one. It is not true, as argued by respondent, that an engineering test of certainty is needed to reserve an area of state jurisdiction. On top of the "engineering and scientific test" that controls this case, the Federal Power Act imposes a "legalistic or governmental" test. Federal jurisdiction may not reach "facilities used in local distribution" of energy. 16 U. S. C. § 824 (b). Thus, state jurisdiction is clearly demarcated and preserved. *Connecticut Light & Power Co.* v. *FPC*, 324 U. S. 515 (1945).

A requirement of tracing studies of the sort demanded by the Court of Appeals—if they are feasible at

[17] "This evidence, we think, furnishes substantial basis for the conclusion of the Commission that facilities of Jersey Central are utilized for the transmission of electric energy across state lines." *Jersey Central, supra*, n. 12, at 67.

all [18]—would take one to two years to conduct.[19] Even under the FPC's supposedly too easily met criteria of jurisdiction, the FP&L matter took almost four years to pass through Commission proceedings;[20] it has been before the courts for four more years. If the congressionally mandated system is to function meaningfully, the judiciary cannot overwhelm it with unworkably high standards of proof. *New England Divisions Case*, 261 U. S. 184, 197 (1923); *Railroad Comm'n of Wisconsin* v. *Chicago, Burlington & Quincy R. Co.*, 257 U. S. 563, 579 (1922).

We note, moreover, that *Jersey Central* type tracing studies become less feasible as interconnections grow more complicated. *Arkansas Power & Light Co.* v. *FPC*, 368 F. 2d 376, 382 (CA8 1966), quoting 34 F. P. C. 747, 751. The requirement of *Jersey Central* type tracing might encourage the artificial and wasteful complication of interconnections for the purpose of avoiding federal jurisdiction. More important, as interconnections proliferate and energy pools grow larger, jurisdictional hurdles like those erected by the Court of Appeals would become ever more difficult to clear. Thus, the greater the need for regulation, the more likely it would become (under the Court of Appeals' rule) that regulation would not be achieved.

As pointed out by the Court of Appeals for the Sev-

[18] "Logic would seem to dictate that where the utility is a member of a combination of utilities and has continuous access to an integrated pool of interstate energy, the tracing of out-of-state energy is indeed difficult, burdensome, and perhaps impossible." *Arkansas Power & Light Co.* v. *FPC*, 368 F. 2d, at 382.

[19] *Public Service Co. of Indiana* v. *FPC*, 375 F. 2d, at 104 n. 7.

[20] The final FPC decision was handed down on May 2, 1967. We do not know when the FPC began its investigation of FP&L. But ignoring what must have been an extended period of initial staff work, we observe that the record shows that FP&L was formally notified on October 3, 1963, that in the opinion of the FPC staff it was subject to FPC jurisdiction. Order Initiating Investigation and Hearing 2412 (T).

enth Circuit in an FPC case similar to this one, even in a criminal prosecution where the highest standards of proof are required, guilt may be shown by circumstantial evidence.[21] The FPC has used tracing studies to show what went into and out of the Turner bus at a given moment; it has marshaled expert opinion to suggest what may reasonably be said to have occurred in the bus at the instant of transmission; it has presented this evidence in a closely reasoned and empirically uncontradicted opinion. Recognizing that the men responsible do not now fully understand electricity,[22] though they know how to use it, and use it on an ever-expanding basis, we do not demand more of the Commission than that its conclusions be substantially supported by expert opinion that is in accord with the facts known for certain. The Commission has done enough to establish its jurisdiction.

The decision of the Court of Appeals is reversed and the case is remanded for reinstatement of the order of the Federal Power Commission.

MR. JUSTICE STEWART, MR. JUSTICE POWELL, and MR. JUSTICE REHNQUIST took no part in the consideration or decision of this case.

MR. JUSTICE DOUGLAS, with whom THE CHIEF JUSTICE concurs, dissenting.

There can be no doubt that Congress has constitutional power to regulate under the Commerce Clause the inter-

[21] "We reject I&M's fundamental proposition in this case that in order to prevail, the Federal Power Commission must do what I&M claims to be impossible, that is, to prove by either tracing or some other unnamed 'scientific and engineering proof' that out-of-state energy reaches the wholsale customers. We might recall that even in criminal cases, guilt beyond a reasonable doubt often can be established by circumstantial evidence." *Indiana & Michigan Electric Co.* v. *FPC*, 365 F. 2d 180, at 184.

[22] "Nobody can say for certain just how electricity is really transmitted." Opinion of the Hearing Examiner, 37 F. P. C., at 568.

state "commingling" of electric power involved in the instant case. See *Connecticut Light & Power Co.* v. *FPC*, 324 U. S. 515, 525–530. The question is whether it has done so.

The Examiner explains the "electromagnetic unity" theory and tells us in electrical engineering terms why that unasserted power of Congress exists:

> "An electric utility system such as [respondent's] is essentially an electro-mechanical system to which all operating generators on the interconnected network are interlocked electromagnetically. This means that electric generators, under ordinary operating conditions, run either at exactly the same speed or at speeds which will result in a frequency of 60 cycles. No operating generator can change its speed by itself as long as it operates connected to the network. All generators connected to the same network must follow each other as to speed and frequency whenever there is a change in frequency, and the frequency of all interlocked generators is always exactly the same.
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> "The electric systems of [respondent] and all other interconnected systems are essentially alike as to electrical, electromagnetic and electromechanical characteristics. Because they are alike, it is possible to have presently existing interconnected operations on a very large scale, extending from the Rocky Mountains to the Atlantic Ocean and from the Canadian to the Mexican border.
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> "If a housewife in Atlanta on the Georgia system turns on a light, every generator on [respondent's] system almost instantly is caused to produce some quantity of additional electric energy which serves to maintain the balance in the interconnected system between generation and load." 37 F. P. C. 544, 567–568.

Evidently undesirous of explicitly overruling the proposition that "[m]ere connection determines nothing," *Jersey Central Power & Light Co.* v. *FPC*, 319 U. S. 61, 72 (1943), the Court avoids validating the FPC's electromagnetic unity theory as the jurisdictional hold over the respondent. Instead, relying on the Commission's expertise, the Court purports to hold a narrower ground that actual flows of FP&L's electricity were in fact measured passing out of Florida through the employment of the Commission's "commingled" tracing method. Closer analysis of this latter wizardry, which had previously been rejected by the Commission, *Connecticut Light & Power Co.*, 3 F. P. C. 132 (1942), reveals, however, that actual flows were not in fact measured but were simply hypothesized using an engineering model which, as the dissenting commissioners observed, "[assumed] the fact in issue, and thus [begged] . . . the question of jurisdiction." The conventional tracing method previously used in cases such as this one reached an entirely different result—that no actual interstate flow of FPL power had occurred. *Jersey Central Power & Light Co.* v. *FPC, supra; Connecticut Light & Power Co.* v. *FPC*, 324 U. S. 515.

The Commission's abandonment of the conventional test in favor of the commingled method will now mean that every privately owned interconnected facility in the United States (except for those isolated in Texas) is within the FPC's jurisdiction. Both tracing methods assume that a momentary increase in FP&L's generation over its local needs will be passed on to the interconnecting Florida Power Corp. (Corp) system located between FP&L and the state line. The conventional system assumes that such excesses will be absorbed by the first few loads reached in the Corp system and therefore will never cross the state line. On the other hand, the commingled approach assumes that the first load which the FP&L excess

reaches will continue to rely upon other utilities' power to a large extent and therefore will absorb only a part of the FP&L excess. The leftover FP&L excess will then travel to the next load, but again, will only supply part of those consumers' needs, with the remainder passing on to the next load, and so on, until some fractional part of the original FP&L excess crosses the state line. Extending the assumption's application, it is clear that any momentary increase in output by any generator located at any point in the ISG grid will send a surge of power throughout the entire network. If this assumption is approved, then it is difficult to perceive what remains of the *Jersey Central* proposition that "[m]ere connection determines nothing."

These scientific facts are, of course, the basis for the grid systems, much in vogue these days. But the Commission has no authority to order a company to enter a grid. Unless it is done voluntarily, as was true here, the Commission by virtue of § 202 (b) of the Federal Power Act can act only[1] "upon application of any State commission or of any person engaged in the transmission or sale of electric energy." 16 U. S. C. § 824a (b).

A company transmitting electric energy in interstate commeree is subject to regulation by the Commission of its wholesale rates. 16 U. S. C. § 824 (b). But there is no claim here that wholesale selling is involved; and the minuscule nature of the "commingling" that has taken place and its incidental nature are doubtless the reasons why the Commission has not undertaken that phase of regulation. The case is therefore unlike *Pennsylvania Water & Power Co.* v. *FPC*, 343 U. S. 414, 419–420. All that is involved here is an effort to make respondent

[1] Apart from the exigencies of "war." See 16 U. S. C. § 824a (c).

follow the Commission's Uniform System of Accounts.[2] 16 U. S. C. § 825 (a).

Rather than the engineering battle over tracing methods, the central question ought to be whether the "commingling" is so *de minimis* as to warrant the fastening of the federal bureaucracy on this local company. The limited purpose of this legislation was stated clearly in the Senate Report:

> "The decision of the Supreme Court in *Public Utilities Commission* v. *Attleboro Steam & E. Co.* (273 U. S. 83) placed the interstate wholesale transactions of the electric utilities entirely beyond the reach of the States. Other features of this inter-

[2] This is not a case where state regulation has a hiatus that the federal regime fills. There is not, in other words, a no-man's area here.

Fla. Stat. § 366.05 (1969), authorizes the Florida Power Commission to "prescribe uniform system and classification of accounts for all public utilities; which among other things shall set up adequate, fair and reasonable depreciation rates and charges." A related section includes within the term public utility every person, corporation, partnership, association, or other legal entity and their lessees, trustees, or receivers operating, managing, or controlling any plant or other facility supplying electricity. *Id.*, § 366.02.

The Commission exercises this power. See 1966 Florida Public Service Comm'n Annual Report 11:

"The Acounting and Auditing Department has the responsibility of maintaining surveillance over the books and records of the various companies within the *Electric* . . . industries subject to regulation by the Commission.

"In meeting this responsibility, the Department maintains a comprehensive file of statistical, financial, and accounting data in the form of annual, quarterly, and monthly reports submitted by the various companies. It maintains a continuous examination of these reports and conducts continuing field audits on the company premises to verify the accuracy . . . to determine the compliance of the basic accounting records with the *Uniform System of Accounts prescribed in the Commission's Rules and Regulations.*" (Emphasis supplied.)

state utility business are equally immune from State control either legally or practically." S. Rep. No. 621, 74th Cong., 1st Sess., 17.[3]

While federal regulation was to be pervasive, once fastened onto a company, Congress expressed an unambiguous policy to preserve and to rely upon effective and adequate state regulation:

> "*The revised bill would impose Federal regulation only over those matters which cannot effectively be controlled by the States.* The limitation on the Federal Power Commission's jurisdiction in this regard has been inserted in each section in an effort to prevent the expansion of Federal authority over State matters." *Id.*, at 18 (emphasis supplied).

And this objective is presented in the statute's language:

> "It is hereby declared . . . that Federal regulation . . . is necessary in the public interest, such Federal regulation, however, to extend only to those matters which are not subject to regulation by the States." Public Utility Holding Company Act of 1935, § 201 (a), 49 Stat. 847.

The Commission does not assert that Florida's regulation of FP&L is inadequate. Each year the Florida Public Service Commission conducts field audits of electric utilities to ensure compliance with its accounting practices and depreciation rates.[4] Other than enhancing the slogan

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[3] *Public Utilities Comm'n* v. *Attleboro Steam & Electric Co.*, 273 U. S. 83 (1927), held that even absent federal legislation the Commerce Clause precluded state rate regulation of sales of energy made by a Rhode Island producer of electricity to a Massachusetts distributor. Thus, one purpose of the Act was to fill the "Attleboro gap" in rate regulation.

[4] Inasmuch as virtually every privately owned utility in the United States (save those in Texas) is interwoven with a grid which at some point intersects a state boundary, the Commission's commingled tracing assumption will effectively eliminate electric utility

of "federal leadership" the Commission cites no function which it might better fulfill than the state regime.

The Court's result also runs counter to the expressed desire of Congress to encourage voluntary interconnection. *Id.*, § 202 (a), 49 Stat. 848. Interconnection between two local companies will now subject both to federal jurisdiction if either is also connected to a grid which at some point crosses a state line. To avoid the costs associated with switching from state to federal regulation a utility may now be induced to sever such interconnections. As the dissenting commissioners recognized:

> "[I]nterconnections serve the objective of reliability, and . . . reliability is strongly in the public interest. But with the present near universality of interconnections, it would seem that the Commission's opinion would as likely lead to present connections being broken as to new connections being established or existing connections strengthened." 37 F. P. C., at 559 (1967).

In light of these congressional purposes I would not superimpose federal regulation on top of state regulation in case of *de minimis* transmissions not made by prearrangement or in case of wholesale transactions. In *Jersey Central Power & Light Co.* v. *FPC, supra,* at 66–67, we let federal regulation be fastened, though the energy transmitted was "small." Yet the transmissions apparently were neither accidental nor *de minimis. Id.,* at 66 n. 4.

In the instant case respondent is a member of the Interconnected Systems Group (ISG) which covers the southeastern and central portions of the United States.

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regulation by States. In light of the congressional intent to avoid this outcome the Court has placed perhaps excessive reliance on the doctrine of judicial deference to agency expertise.

The Commission approved the Examiner's finding that "all 140 members of the ISG operate in parallel and are interlocked electromagnetically; and that FPL [respondent] can receive from or contribute to ISG up to 100 mw. The record further supports the Examiner's findings that FPL normally has no control over the actual transfers of electric power and energy with any particular electric system with which it is interconnected; that since electric energy can be delivered virtually instantaneously when needed on a system at a speed of 186,000 miles per second, such energy can be and is transmitted to FPL when needed from out-of-state generators, and in turn can be and is transmitted from FPL to help meet out-of-state demands; and finally, that there is a cause and effect relationship in electric energy occurring throughout every generator and point on the FPL, Corp, Georgia, and Southern systems which constitutes interstate transmission of electric energy by, to, and from FPL." 37 F. P. C., at 549.

In the instant case apart from the infinitesimal and sporadic exchanges the Commission only found that "FPL [respondent] contributed 8 mw to ISG to assist a midwestern utility which had sustained a 580-mw generator loss." *Ibid.* And that single episode could be measured in terms of seconds only. Such fleeting episodes are not in my view sufficient to displace a state regime with the federal one, since the Congress promised that as much as possible be left to the States. I would not make that a hollow promise.

If we allow federal pre-emption in this case, then we have come full cycle leaving local authorities control of electric energy only insofar as municipal plants are concerned. The federal camel has a tendency to occupy permanently any state tent.

That may be a wise course; but if so, Congress should make the decision.